DM-MD6X1

6x1 DigitalMedia™ Switcher

The DM-MD6X1 delivers an incredibly versatile and cost-effective solution for managing a complete range of digital and analog AV sources in a small conference room or classroom, or as part of a larger DigitalMedia distribution system. High-resolution computer signals, standard and high-definition video, stereo analog and digital multi-channel audio sources are all handled by the DM-MD6X1, providing a perfect standalone switcher or multi-format interface for installation in an equipment rack or presentation lectern.

Additional DigitalMedia (DM) inputs and output allow the DM-MD6X1 to work with the full line of Crestron® DM transmitters, switchers, receivers, and room controllers, affording extensive capabilities for routing and distributing all of today's multimedia AV signal types throughout a single room or larger facility. Combining DM technology with a full complement of analog connections affords a perfect signal converter for integrating DigitalMedia into any analog-based system like Crestron MPS, QuickMedia®, and the CEN-RGBHV Series.

Multimedia Computer/AV Switcher
Inputs on the DM-MD6X1 include multi-format BNC video, RGB, HDMI®, balanced line-level and SPDIF digital audio. The HDMI input supports HDMI with HDCP, handling WUXGA computer resolutions and 1080p60 HDTV with multi-channel lossless audio. The HDMI input can also handle DVI and DisplayPort Multimode signals using an appropriate adapter or dongle[1]. The RGB input handles analog RGB signals up to WUXGA 1920x1200 pixels, as well as component video up to 1080p60[2]. The multi-format BNC input also accepts component HDTV signals up to 1080p60, as well as standard definition NTSC/PAL composite and S-Video. Dedicated audio inputs include two stereo balanced line-level analog and one SPDIF coaxial digital.

Additional inputs are easily added at locations up to 450 feet (137 m) away[3] using DM Transmitters. Three CAT-type DM inputs are provided on the DM-MD6X1, accepting inputs from individual DM Transmitters as well as other DM switchers. A single DM CAT output is provided to drive a DM Receiver/Room Controller at the display location, or to feed another DM switcher. HDMI and analog audio outputs are also included to feed a local video display and audio system. The analog stereo output includes professional balanced terminals and programmable volume control.

DigitalMedia™
As the leader in HDMI and control system technologies, Crestron has developed DigitalMedia, the first complete HD AV distribution system that takes HDMI to a higher level, and allows virtually any mix of AV sources to be distributed throughout the home, office, school, or virtually any other facility.

DigitalMedia distributes uncompressed digital video and audio signals up to 450 feet (137 m) using DM cable[3]. DigitalMedia thoughtfully manages all of the different signals and devices, matching each source's output to the capabilities of the selected display(s) without using scaling or compression. Every signal is preserved in its native video resolution and audio format, ensuring a pure, lossless signal path throughout.

QuickSwitch HD® Technology
Crestron exclusive QuickSwitch HD technology minimizes the annoying switching latency that plagues typical HDMI switchers. QuickSwitch HD achieves very fast switching of HDMI signals by maintaining a constant HDCP connection with each HDMI device in the system, eliminating the need to re-authenticate each time a different source is selected.

Keyboard/Mouse Extender
The DM-MD6X1 also functions as a keyboard/mouse extender and switcher, allowing a computer or other USB HID-compliant host device connected to the DM-MD6X1 to be controlled by a keyboard and mouse at the display location using a DM-RMC-100-1 room controller, or at a presenter's location using select DM transmitters.

EDID Format Management
The DM-MD6X1 allows for management of the EDID (Extended Display Identification Data) information that passes between the display devices and input sources in the system. Using Crestron Toolbox™ software, the format and resolution capabilities of each device can be assessed and managed through the DM-MD6X1, ensuring reliable operation by instructing sources to output only the resolutions and formats that can be handled by the displays and system wiring.

CEC Embedded Device Control
The primary objective of every Crestron system is to enable precisely the control desired for a seamless user experience. DigitalMedia provides an alternative to conventional IR and RS-232 device control by harnessing the CEC (Consumer Electronics Control) signal embedded in HDMI. Through its connection to the control system, the DM-MD6X1 provides a gateway for controlling AV devices right through their HDMI connections, potentially eliminating the need for any dedicated control wires or IR probes. Through proper CEC signal management, DigitalMedia allows you to take control of each device in the system as you like.

Easy Setup
The DM-MD6X1 is designed to be placed on a shelf or mounted in an equipment rack or lectern. The front panel provides basic operation right out of the box. User-friendly setup and troubleshooting tools are provided via Crestron Toolbox™ software, performing automatic input and output configuration while letting the installer make intelligent design decisions along the way. The switcher even tests and measures the length of each DM cable, automatically making the appropriate calibrations for optimal signal transmission to each DM device.

DM-MD6X1 6x1 DigitalMedia™ Switcher

A Digital Upgrade for Legacy Systems
The DM-MD6X1 also affords a perfect signal converter for integrating DigitalMedia with analog-based systems like Crestron MPS, QuickMedia®, and the CEN-RGBHV Series. A simple HD15 VGA cable connected between the output of an MPS system and the input of the DM-MD6X1 allows every RGB, component, S-Video, and composite video input on the MPS to be converted to DigitalMedia[2]. Analog audio is converted similarly through a simple balanced stereo audio cable. The DM-MD6X1's HDMI and DM inputs may also be used to expand the input capabilities of the MPS system to handle digital AV sources, and its analog audio output can easily be fed into any spare input on the MPS to allow the digital audio signals to be amplified and controlled through the MPS system.

Please refer to the DigitalMedia Design Guide, Doc. #4789 for additional information.

> DigitalMedia™ switcher and interface

> HDMI®, RGB, and multi-format BNC video inputs

> Balanced analog and SPDIF audio inputs

> 3 DM CAT inputs and 1 DM CAT output

> HDMI and analog stereo audio outputs

> Integrated USB HID keyboard/mouse extender and switch

> Supports HDMI with multi-channel lossless audio

> Supports video resolutions up to WUXGA 1920x1200 and HD 1080p60

> Detects and reports detailed video and audio input information

> Performs automatic AV signal format management via EDID

> Allows cable length to 450 feet using DigitalMedia Cable

> QuickSwitch HD® technology achieves low-latency HDMI switching

> Enables device control via CEC

> Support 3D HDTV via DM in/out

> Easy setup and diagnostics tools via software

> Extends the life of analog-based AV systems

> Built-in power distribution for DM transmitters and room controller

> 2-space 19-inch rack-mountable

SPECIFICATIONS

Video

Switcher: 6x1 combination digital/analog switch, Crestron QuickSwitch HD®
Input Signal Types: DM CAT (DigitalMedia over shielded twisted-pair copper wire), HDMI®, DVI[1], DisplayPort Multimode[1], RGB, component (YPbPr)[2], S-Video (Y/C)[2], composite[2]
Output Signal Types: DM CAT, HDMI, DVI[1]
Formats: HDMI, DVI, HDCP content protection support, 3D (via DM only), RGBHV up to UXGA/WUXGA, HDTV up to 1080p60, NTSC or PAL
Input Resolutions, HDMI, Progressive: 640x480@60Hz, 720x480@60Hz (480p), 720x576@50Hz (576p), 800x600@60Hz, 848x480@60Hz, 852x480@60Hz, 854x480@60Hz, 1024x768@60Hz, 1024x852@60Hz, 1024x1024@60Hz, 1280x720@50Hz (720p50), 1280x720@60Hz (720p60), 1280x768@60Hz, 1280x800@60Hz, 1280x960@60Hz, 1280x1024@60Hz, 1360x768@60Hz, 1365x1024@60Hz, 1366x768@60Hz, 1400x1050@60Hz, 1440x900@60Hz, 1600x900@60Hz, 1600x1200@60Hz, 1680x1050@60Hz, 1920x1080@24Hz (1080p24), 1920x1080@25Hz (1080p25), 1920x1080@50Hz (1080p50), 1920x1080@60Hz (1080p60), 1920x1200@60Hz, 2048x1080@24Hz, 2048x1152@60Hz, plus any other resolution allowed by HDMI up to 165MHz pixel clock
Input Resolutions, HDMI, Interlaced: 720x480@30Hz (480i), 720x576@25Hz (576i), 1920x1080@25Hz (1080i25), 1920x1080@30Hz (1080i30), plus any other resolution allowed by HDMI up to 165MHz pixel clock
Input Resolutions, RGB: 640x480@60Hz, 720x480@60Hz (480p), 720x576@50Hz (576p), 800x600@60Hz, 848x480@60Hz, 1024x768@60Hz, 1280x720@50Hz (720p50), 1280x720@60Hz (720p60), 1280x768@60Hz, 1280x800@60Hz, 1280x960@60Hz, 1280x1024@60Hz, 1360x768@60Hz, 1366x768@60Hz, 1400x1050@60Hz, 1440x900@60Hz, 1600x1200@60Hz, 1680x1050@60Hz, 1920x1080@24Hz (1080p24), 1920x1080@50Hz (1080p50), 1920x1080@60Hz (1080p60), 1920x1200@60Hz, 2048x1080@24Hz, 2048x1152@60Hz
Input Resolutions, Component: 480i, 576i, 480p, 576p, 720p50, 720p60, 1080i25 (1125 lines), 1080i30, 1080p30, 1080p50 (1125 lines), 1080p60
Input Resolutions, Composite and S-Video: 480i, 576i
Output Resolutions: Matched to inputs
Analog-To-Digital Conversion: 10-bit 165 MHz per each of 3 channels

Audio

Switcher: 6x1 combination digital/analog switch, limited audio breakaway[4]; independent input compensation and master volume adjustment for analog output
Input Signal Types: DM CAT, HDMI, DisplayPort Multimode[1], S/PDIF coaxial, analog stereo
Output Signal Types: DM CAT, HDMI, analog stereo
Formats, HDMI and SPDIF: Dolby Digital®, Dolby Digital EX, DTS®, DTS-ES, DTS 96/24, 2ch PCM
Formats, HDMI only: Up to 8ch PCM
Formats, Analog: Stereo 2-Channel
Analog-To-Digital Conversion: 24-bit 48 kHz
Digital-To-Analog Conversion: 24-bit 48 kHz
Volume Gain Range (analog out): -80dB to 0dB, adjustable from 0% to 100%
Input Compensation (analog out): ±10dB per input
Performance (analog): Frequency Response: 20Hz to 20kHz ±0.75dB;
S/N Ratio: >90dB, 20Hz to 20kHz A-weighted;
THD+N: <0.05% @ 1kHz;
Stereo Separation: >90dB

Communications

DigitalMedia: DM CAT, DMNet, HDCP management, EDID format management, CEC
Ethernet: 10BaseT/100BaseTX, auto-switching, auto-negotiating, auto-discovery, full/half duplex, TCP/IP, UDP/IP, CIP, DHCP, RSTP
USB: Supports USB HID class devices

Ethernet Switch

Provides (1) onboard 10BaseT/100BaseTX Ethernet port, (1) internal 10BaseT/100BaseTX Ethernet port for the switcher, and (4) remote 10BaseT/100BaseTX Ethernet ports via select outboard devices

Connectors

VIDEO IN 1: (3) BNC female comprising (1) auto-sensing multi-format analog video input;
Signal Types: Component (YPbPr), S-Video (Y/C), or composite input;
Input Level: 1 Vp-p nominal;
Input Impedance: 75 Ohms nominal

DM-MD6X1 6x1 DigitalMedia™ Switcher

AUDIO OUT: (1) 5-pin 3.5mm detachable terminal block;
Balanced/unbalanced stereo line-level output, variable level;
Output Impedance: 200 Ohms balanced, 100 Ohms unbalanced;
Maximum Output Level: 4 Vrms balanced, 2 Vrms unbalanced
DM IN D/M 4 - 6: (3) DM CAT inputs, each composed of (2) 8-pin RJ45 female, shielded;
Connect to DM CAT outputs of DM transmitters or other DM devices via DM-CBL cable[3]
DM IN 24ABG: (3) 4-pin 3.5mm detachable terminal blocks, DMNet ports;
Connect to DMNet ports of DM transmitters or other DM devices via DM-CBL cable[3]
DM OUT D/M: (1) DM CAT output composed of (2) 8-pin RJ45 female, shielded;
Connects to DM CAT input of a DM receiver/room controller, switcher, or other DM device via DM-CBL cable[3]
DM OUT 24ABG: (1) 4-pin 3.5mm detachable terminal block, DMNet port;
Connects to DMNet port of a DM receiver/room controller, switcher, or other DM device via DM-CBL cable[3]
EXT PWR: (1) 3-pin 3.5mm detachable terminal block, power selection port;
Connects to an external power supply[5], or to the internal power source via a jumper, to power the DM devices connected to DM IN 4 - 6 and DM OUT;
Maximum Load: 75 Watts (3.13 Amps @ 24 Volts DC) total for all ports when connected to external power supply[5], otherwise limited to available DMNet power (see "Power Requirements" below)
HDMI OUT: (1) 19-pin Type A HDMI female;
HDMI digital video/audio output;
Carries same audio and video signals as DM OUT
USB HID: (1) USB Type B female;
USB 1.1 device port for connection to the USB host interface of a computer or other USB HID-compliant host device
LAN: (1) 8-wire RJ45 female w/2 LED indicators;
10BaseT/100BaseTX Ethernet port;
Green LED indicates link status;
Yellow LED indicates Ethernet activity
100-240V ~2.3A 50/60Hz: (1) IEC C14 male chassis plug, main power input;
Mates with removable power cord, included
G: (1) 6-32 screw, chassis ground lug
COMPUTER (front): (1) USB Type B female;
USB 1.1 computer console port (6 ft cable included)

DM Cable Length

Cable Type:
DM-CBL DigitalMedia CableMaximum length per port without, between, before, or after repeaters:

- 200 ft (60 m) for 720p, 1080i, 1080p24
- 200 ft (60 m) for 1024x768 @75Hz
- 150 ft (45 m) for 1080p60
- 150 ft (45 m) for 1280x1024 @75Hz
- 150 ft (45 m) for 1920x1200 @60Hz
- 125 ft (38 m) for 1600x1200 @60Hz

Maximum total length per port using up to 2 repeaters:

- 450 ft (137 m) for 720p, 1080i, 1080p24
- 450 ft (137 m) for 1024x768 @75Hz
- 450 ft (137 m) for 1080p60
- 450 ft (137 m) for 1280x1024 @75Hz
- 450 ft (137 m) for 1920x1200 @60Hz
- 375 ft (114 m) for 1600x1200 @60Hz

Controls and Indicators

PWR: (1) green LED, indicates operating power supplied via Main Power Input
USB HID DISABLED: (1) red LED, indicates the COMPUTER port is in use causing USB HID to be disabled
RESET: (1) recessed miniature pushbutton for hardware reset, reboots the switcher
SYNC: (1) pushbutton and red LED, selects SYNC mode so the INPUTS LEDs indicate input signal presence
ROUTE: (1) pushbutton and red LED, selects ROUTE mode to allow routing changes
INPUTS 1 - 6: (6) pushbuttons and red LEDs, select input for routing
SETUP (rear): (1) red LED and (1) miniature recessed pushbutton for Ethernet auto-discovery

Power Requirements

Main Power: 90 Watts @ 100-240 Volts AC, 50/60 Hz
Available DMNet Power: 30 Watts (1.25 Amps @ 24 Volts DC) from internal power supply

Environmental

Temperature: 32° to 104°F (0° to 40°C)
Humidity: 10% to 90% RH (non-condensing)
Heat Dissipation: 307 BTU/Hr

Enclosure

Chassis: Metal with black finish, vented sides, fan-cooled
Faceplate: Extruded aluminum, black finish with polycarbonate label overlay
Mounting: Freestanding or 2U 19-inch rack-mountable (adhesive feet and rack ears included)

Dimensions

Height: 3.47 in (89 mm) without feet
Width: 17.03 in (433 mm), 19.00 in (483 mm) with ears
Depth: 12.21 in (310 mm)

Weight

7.5 lb (3.4 kg)

Available Models

DM-MD6X1: 6x1 DigitalMedia™ Switcher

Available Accessories

DM-CBL-P-SP500: DigitalMedia™ Cable, plenum-rated, 500 ft spool
DM-CBL-NP-SP500: DigitalMedia™ Cable, non-plenum, 500 ft spool
DM-CONN-20: DigitalMedia™ Cable Connectors, 20-Pack
DM-DR: DigitalMedia™ CAT Repeater
CBL-HD-1.5: Crestron® Certified HDMI® Interface Cable, 1.5 ft
CBL-HD-3: Crestron® Certified HDMI® Interface Cable, 3 ft
CBL-HD-6: Crestron® Certified HDMI® Interface Cable, 6 ft
CBL-HD-12: Crestron® Certified HDMI® Interface Cable, 12 ft
CBL-HD-20: Crestron® Certified HDMI® Interface Cable, 20 ft
CBL-HD-30: Crestron® Certified HDMI® Interface Cable, 30 ft
CBL-DP-HD-1.5: Crestron® Certified DisplayPort to HDMI® Interface Cable, 1.5 ft [Discontinued]
CBL-DP-HD-3: Crestron® Certified DisplayPort to HDMI® Interface Cable, 3 ft [Discontinued]
CBL-DP-HD-6: Crestron® Certified DisplayPort to HDMI® Interface Cable, 6 ft [Discontinued]
CBL-DP-HD-12: Crestron® Certified DisplayPort to HDMI® Interface Cable, 12 ft [Discontinued]
CBL-DP-HD-20: Crestron® Certified DisplayPort to HDMI® Interface Cable, 20 ft [Discontinued]
CBL-DP-HD-30: Crestron® Certified DisplayPort to HDMI® Interface Cable, 30 ft [Discontinued]
CBL-HD-DVI-1.5: Crestron® Certified HDMI® to DVI Interface Cable, 1.5 ft
CBL-HD-DVI-3: Crestron® Certified HDMI® to DVI Interface Cable, 3 ft
CBL-HD-DVI-6: Crestron® Certified HDMI® to DVI Interface Cable, 6 ft

CBL-HD-DVI-12: Crestron® Certified HDMI® to DVI Interface Cable, 12 ft
CBL-HD-DVI-20: Crestron® Certified HDMI® to DVI Interface Cable, 20 ft
CBL-HD-DVI-30: Crestron® Certified HDMI® to DVI Interface Cable, 30 ft
CBL-VGA-1.5: Crestron® Certified Computer VGA Interface Cable, 1.5 ft
CBL-VGA-3: Crestron® Certified Computer VGA Interface Cable, 3 ft
CBL-VGA-6: Crestron® Certified Computer VGA Interface Cable, 6 ft
CBL-VGA-12: Crestron® Certified Computer VGA Interface Cable, 12 ft
CBL-VGA-25: Crestron® Certified Computer VGA Interface Cable, 25 ft
CBL-RCA-1.5: Crestron® Certified RCA Coaxial Digital Audio Interface Cable, 1.5 ft
CBL-RCA-3: Crestron® Certified RCA Coaxial Digital Audio Interface Cable, 3 ft
CBL-RCA-6: Crestron® Certified RCA Coaxial Digital Audio Interface Cable, 6 ft
CBL-RCA-12: Crestron® Certified RCA Coaxial Digital Audio Interface Cable, 12 ft
MP-WP130-B: Media Presentation Wall Plate - DB15HD Computer VGA w/ Mini-TRS Stereo Audio, Bulkhead, Black
MP-WP130-W: Media Presentation Wall Plate - DB15HD Computer VGA w/ Mini-TRS Stereo Audio, Bulkhead, White
MP-WP131-B: Media Presentation Wall Plate - DB15HD Computer VGA w/ Mini-TRS Stereo Audio, Breakout, Black
MP-WP131-W: Media Presentation Wall Plate - DB15HD Computer VGA w/ Mini-TRS Stereo Audio, Breakout, White
MP-WP150-B: Media Presentation Wall Plate - HDMI® w/Mini-TRS Stereo Audio, Black
MP-WP150-W: Media Presentation Wall Plate - HDMI® w/Mini-TRS Stereo Audio, White
MP-WP152-B: Media Presentation Wall Plate - HDMI®, Black
MP-WP152-W: Media Presentation Wall Plate - HDMI®, White
MP-WP160-B: Media Presentation Wall Plate - DisplayPort w/Mini-TRS Stereo Audio, Black
MP-WP160-W: Media Presentation Wall Plate - DisplayPort w/Mini-TRS Stereo Audio, White
MP-WP162-B: Media Presentation Wall Plate - DisplayPort, Black
MP-WP162-W: Media Presentation Wall Plate - DisplayPort, White
MP-WP140-B: Media Presentation Wall Plate - DVI-I w/Mini-TRS Stereo Audio, Black
MP-WP140-W: Media Presentation Wall Plate - DVI-I w/Mini-TRS Stereo Audio, White
MP-WP185-B: Media Presentation Wall Plate - DigitalMedia™ CAT, Black
MP-WP185-W: Media Presentation Wall Plate - DigitalMedia™ CAT, White

Notes:
1. HDMI requires an appropriate adapter or interface cable to accommodate a DVI or DisplayPort Multimode signal. CBL-HD-DVI and CBL-DP-HD interface cables available separately.

2. The RGB input can accept component, composite, and S-Video signals via direct interface to Crestron MPS Series products, or through an appropriate adapter (not included). Input sync detection is not provided for composite or S-Video signal types through the RGB connection.

3. For DigitalMedia CAT wiring, use DM-CBL DigitalMedia Cable. Up to two DM Repeaters (Model DM-DR) may be required. Refer to the Crestron DigitalMedia Design Guide, Doc. #4789 for complete wiring guidelines.

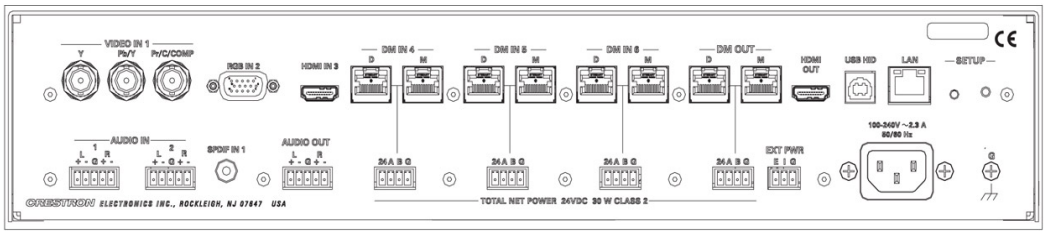
4. Audio breakaway capabilities and limitations: AUDIO/SPDIF IN 1 and AUDIO IN 2 may each be switched freely regardless which video input is selected; HDMI IN 3 audio may be switched freely only when HDMI IN 3 video, or any DM IN video input, is selected; HDMI IN 3 audio cannot be selected when VIDEO IN 1 or RGB IN 2 video inputs are selected; DM IN 4, DM IN 5, and DM IN 6 audio may each be switched freely except when any other numbered DM IN video input is selected; AUDIO IN 1 and SPDIF IN 1 inputs are mutually exclusive.

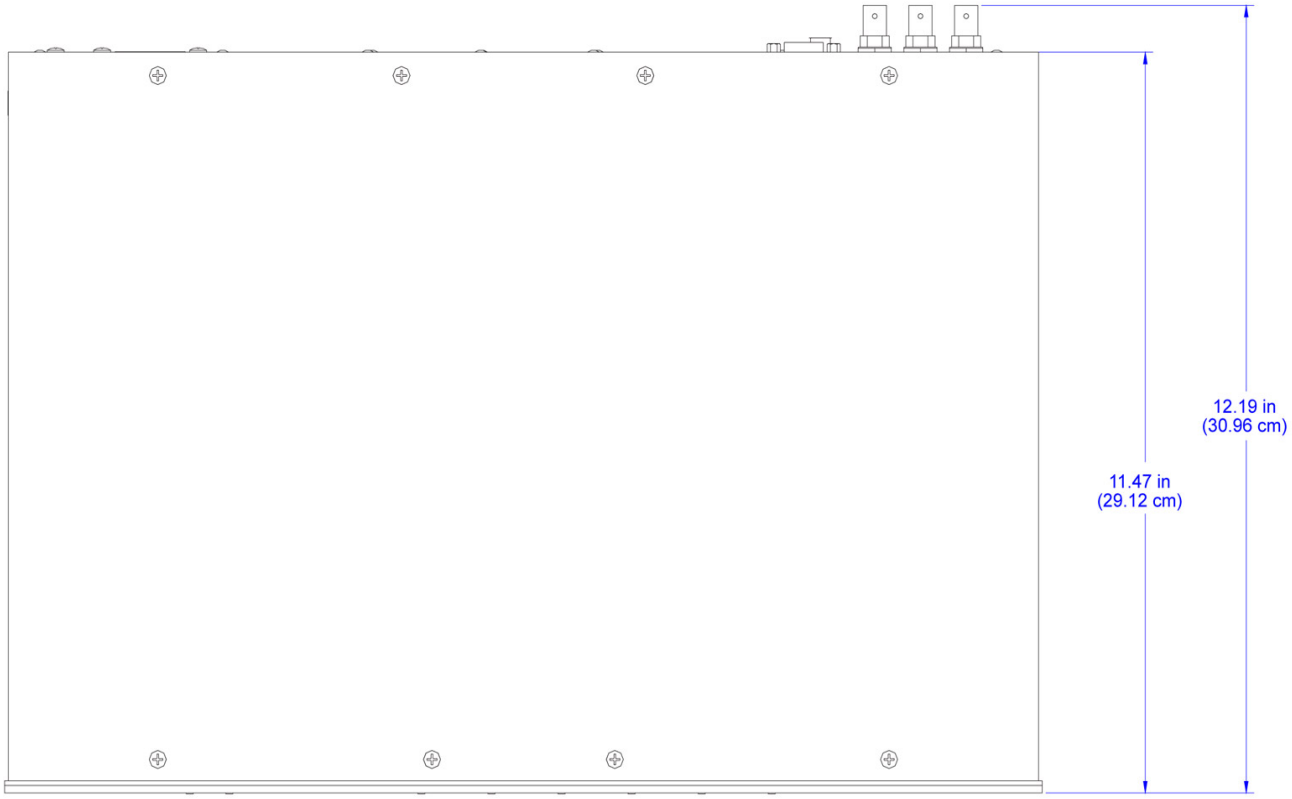
5. For external DMNet power, use a Crestron CNPWS-75, C2N-SPWS300, or other Cresnet power supply as required. Do not interconnect DMNet with Cresnet.

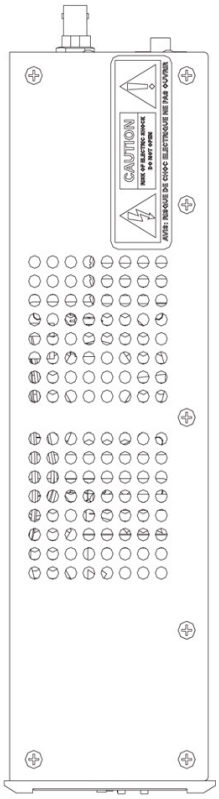
This product may be purchased from an authorized Crestron dealer. To find a dealer, please contact the Crestron sales representative for your area. A list of sales representatives is available online at www.crestron.

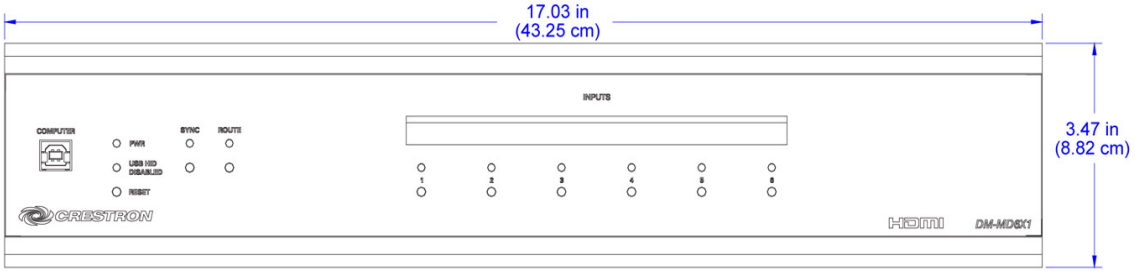
Crestron Electronics, Inc. 15 Volvo Drive I Rockleigh, NJ 07647
Tel: 800.237.2041 / 201.767.3400 I Fax: 201.767.1905
www.crestron.com

DM-MD6X1 6x1 DigitalMedia™ Switcher









Crestron Electronics, Inc. 15 Volvo Drive I Rockleigh, NJ 07647
Tel: 800.237.2041 / 201.767.3400 I Fax: 201.767.1905
www.crestron.com

All brand names, product names and trademarks are the property of their respective owners.
©2013 Crestron Electronics, Inc.
Specifications subject to change without notice. 7/11/2013